

What Ignoring Lime Can Do to Corn and Soybeans

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Soil test values from Marinette Co. corn

	Field 1	Field 2
pH	4.4	4.3
OM (%)	1.0	1.3
P (ppm)	64	158
K (ppm)	91	80

Southern WI problem field soil test values

	Field 3		Field 4		Field 5	
	Poor	Good	Poor	Good	Poor	Good
pH	4.6	4.9	3.9	4.5	3.8	4.9
OM (%)	2.0	3.0	0.9	0.9	1.1	1.6
P (ppm)	183	191	104	75	159	69
K (ppm)	139	120	84	83	91	71

Southern WI problem plant tissue values

	Field 3	Field 4	Field 5
N %	4.79	2.17	2.86
P %	0.43	0.63	0.36
K %	2.43	2.94	2.35
Ca %	1.54	0.30	0.16
Mn ppm	1254	1306	683

pH x herbicide studies, 2003

Hancock

target pH 4.5 – 7.0

actual pH 5.07 – 6.72

2 varieties (NK45A6; Pioneer 36NT1)

3 herbicide treatments

Banvel

pre-emergence Callisto

post-emergence Callisto

Spooner

target pH 4.7 – 6.7

actual pH 4.78 – 6.78

post-emergence Callisto to all

Effect of pH and herbicide treatment on corn grain yields Hancock, 2003

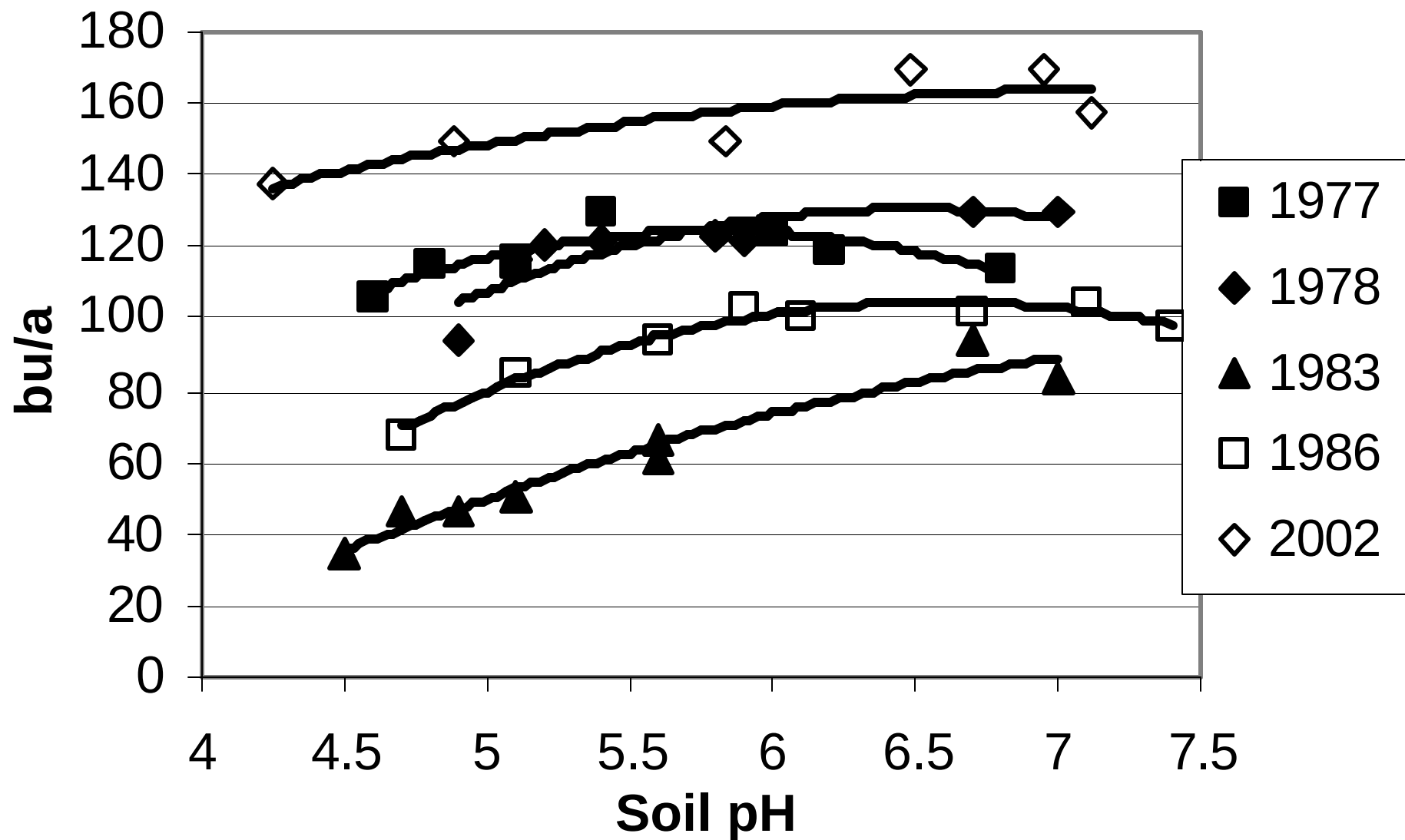
Target pH	Actual pH	Corn grain		
		Banvel	pre-Call	post-Call
		----- bu/a -----		
4.5	5.07	190	190	202
5.0	5.27	205	203	202
5.5	5.57	202	203	203
6.0	6.11	203	206	208
6.5	6.45	198	206	202
7.0	6.72	202	205	207

Effect of pH on corn yields at Spooner, 2003

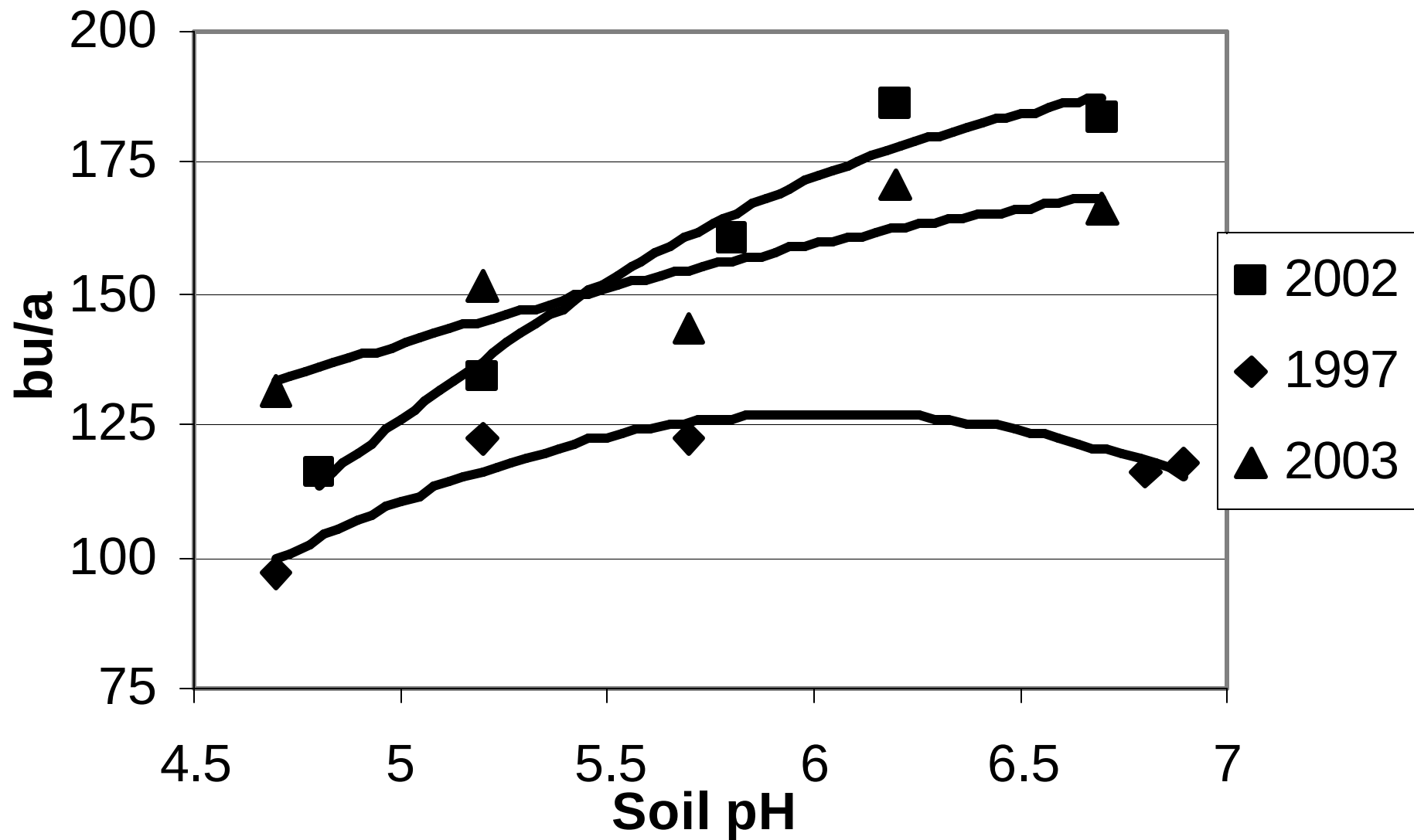
Target pH	Actual pH	Grain yield ----- bu/a -----
4.7	4.78	132
5.2	5.22	152
5.7	5.53	143
6.2	6.41	171
6.7	6.78	166

Post-emergence Callisto applied to all plots

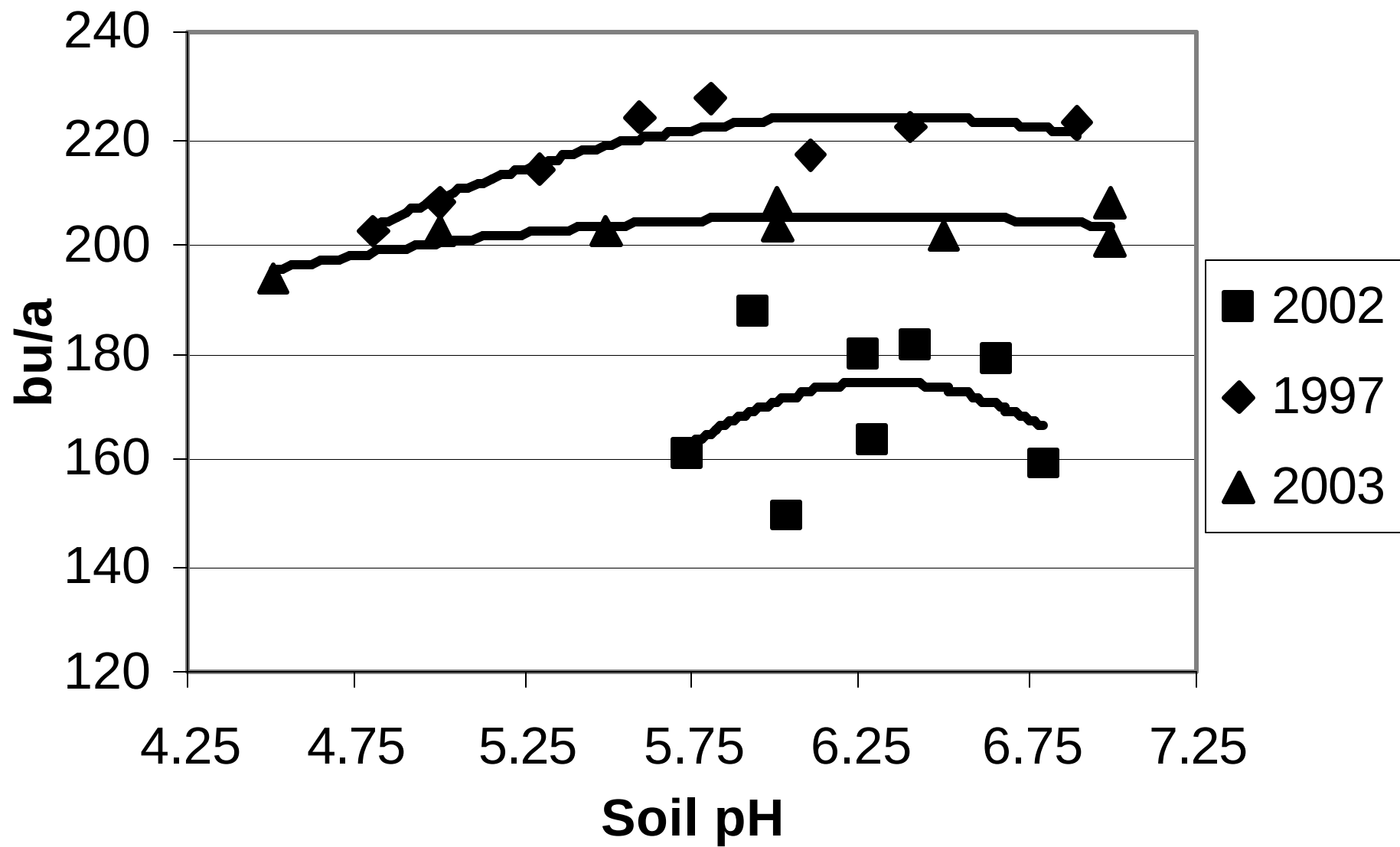
Marshfield Grain



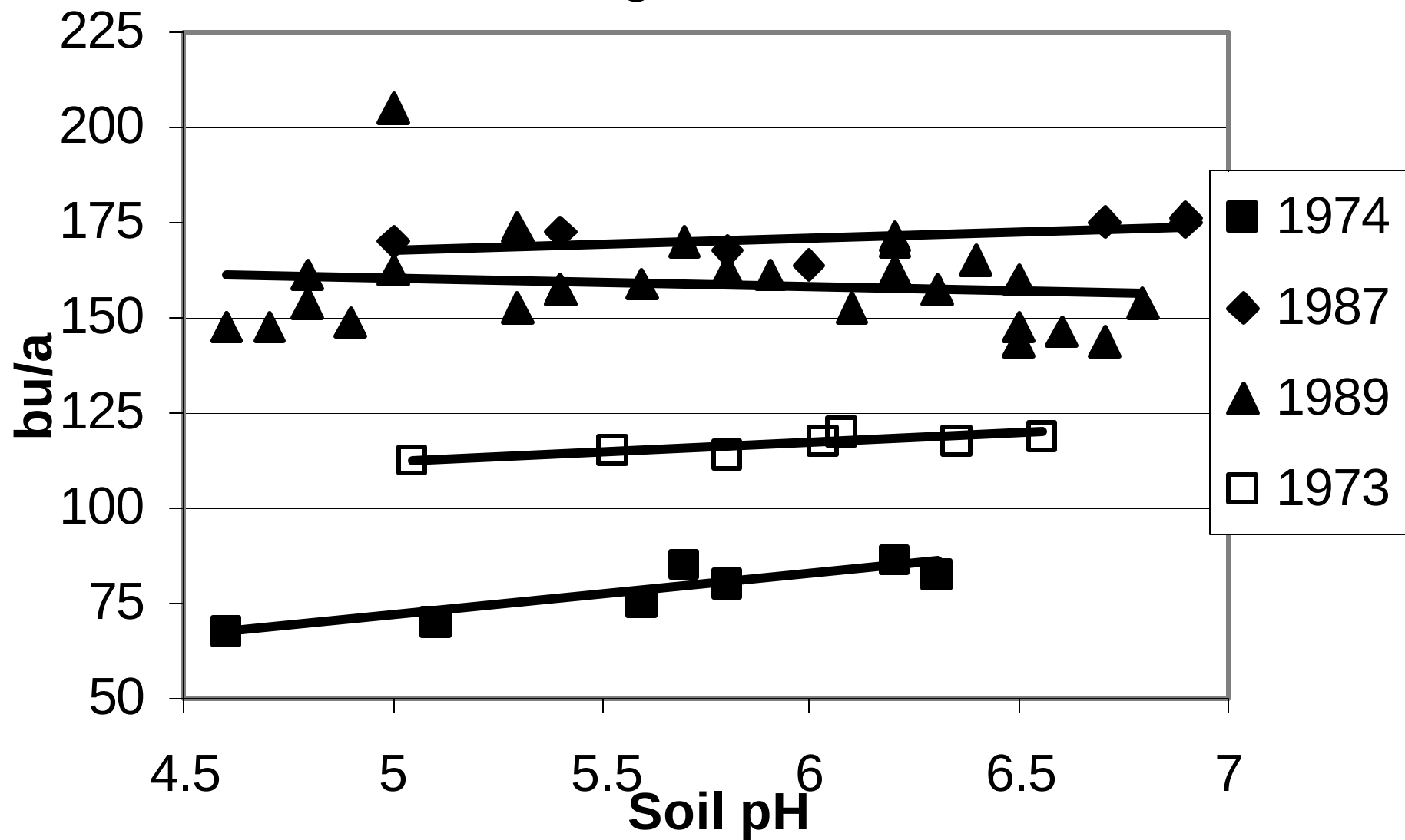
Spooner Grain



Hancock Grain



Arlington Grain



Soybean response to soil pH at Marshfield and Arlington

Soil pH	Marshfield	Arlington
	-----	-----
	bu/a	
4.5	17.3	--
4.7	22.7	38.0
4.9	22.1	--
5.3	29.5	38.0
5.7	--	38.8
6.3	32.1	39.7
7.1	--	43.4

Average of four varieties at each location (adapted from Gritton et al., 1985)

Conclusions:

- Grain farmers **do** need to worry about soil pH
- Manganese toxicity occurs at $\text{pH} < 5.0$
- Yield responses seen to pH 6.0 and above
- Target pH values about right
 - corn = 6.0
 - soybean = 6.3
- No herbicide interactions observed in 2003

The Absolute End

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